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THE PLANT DISEASE BULLETIN

Issued By

The Plant Disease Survey

SUPPLEMENT 3

Summary of Plant Diseases in the United States in 1918 -- Diseases of Field and Vegetable Crops. (Continued)

June 10, 1919

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

SUMMARY OF PLANT DISEASES IN THE UNITED STATES IN 1918

III. DISEASES OF FIELD AND VEGETABLE CROPS (Continued)

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DISEASES OF SWEET POTATO

Stem rot caused by *Fusarium batatatis* Woll. and *F. hyperoxysporum* Woll.

Stem rot in 1918 was about as prevalent as in 1917 and probably more so than in 1916. It was found in New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Florida, Alabama, Louisiana, Texas, Arkansas, Oklahoma and Kansas.

It was more abundant in the northern sweet potato states than in those of the South. It was said to be general in New Jersey, Delaware, Virginia (on the east shore and near Williamsburg), North Carolina, Louisiana, Oklahoma (southeastern part), Arkansas and Kansas. It was somewhat scattered in Maryland and Alabama, local in Tennessee, South Carolina, Florida and Texas.

This disease caused severe losses, taking as high as 90 to 100% of the crop in local cases. The states where the greatest losses occurred apparently were New Jersey, Delaware and Maryland, in which from 18 to 20% of the crop was destroyed. The remaining states sustained losses ranging from a trace to 8%.

Reports from Maryland, North Carolina, Louisiana, and Oklahoma show that it is being introduced into these states on potatoes and slips brought in from infested areas. It was first reported in June in Louisiana, September in Kansas, and September 15 in Tennessee. In Florida the Nancy Hall was reported as extremely susceptible, while Triumph and Porto Rico were more or less resistant.

Foot rot caused by Plenodomus destruens Harter.

Foot rot was present during 1918 in New Jersey, Maryland, Virginia, Florida, Missouri, Iowa and California. It was reported not found in Delaware, South Carolina, Louisiana, Texas, Oklahoma and Arkansas.

It was said to be of slight prevalence in Maryland and abundant in Virginia. In Florida only a trace was found.

The losses were slight in most of the states where it occurred. In the northern end of Accomac County, Virginia, there was a crop injury of about 15% with a 2% loss for the state. In Missouri there was about 2% crop injury and 1/2% loss.

Black rot caused by Sphaeronema fimbriatum (E. & H.) Sacc.

Black rot was reported found in New Jersey, Delaware, Maryland, Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Mississippi, Louisiana, Texas, Oklahoma and Arkansas.

It was reported general in New Jersey, Delaware, Kentucky, Tennessee, South Carolina, Mississippi, Louisiana, Texas, Oklahoma and Iowa. It was scattered in Georgia, Arkansas and Kansas. It was said to have been less prevalent in 1918 than 1917 in New Jersey, Delaware and Oklahoma.

It was apparently most severe in Maryland, Tennessee, South Carolina, Georgia and Texas, where the losses ranged from 7 to 10%. It was less severe in New Jersey, Delaware and North Carolina and slight in the remainder of the states.

In Georgia black rot is showing where the seed potatoes are neither selected nor treated. In Oklahoma it was worst on imported stock. Patches set from slips instead of cuttings were especially affected in Louisiana. Drought in Texas aided materially in checking the trouble. No varietal resistance was reported.

It appeared as follows:

July..... Louisiana	September..... Kansas
July 18..... Virginia	Sept. 15 ..... Tennessee

Soil rot (formerly called pox) caused by Cystospora batata Elliott

Soil rot was apparently more abundant in 1918 than in the preceding years. The disease appears not to have spread rapidly. It was reported from New Jersey, Delaware, Texas, Arkansas (first report), and Kansas (first report). It was reported not to have been found in Kentucky, Louisiana and Oklahoma.

It was very plentiful in Delaware in the district from below Felton extending to Harrington and eastward to include the area to Frederica, Houston,

Mulford and Lincoln. In Texas it was common, being one of the three most important sweet potato diseases there. In Arkansas it was somewhat scattered. In Kansas it was said to be very prevalent.

The loss was somewhat severe in Delaware in the Houston district where on one farm the damage ran as high as 85%. The average loss for the state was 5% or more. In Texas it was severe with a 4% loss. In Arkansas it was moderately severe. In Kansas it produced a crop injury of about 5%.

Drought in Texas prevented it from being as severe as if there had been abundant moisture. Where the crop had been grown in a field in Delaware continuously for eight years the loss was high.

Control methods recommended in Delaware were rotation, seed selection, seed treatment (1 oz. $HgCl_2$ in 8 gal. H_2O for 15 min.), and change of soil.

Scurf caused by Monilochaetes infuscans E. & E.

In 1918 reports were received from an unusually large number of states. It was found in New Jersey, Delaware, Maryland, Virginia, Kentucky (first report), Tennessee (first report), South Carolina, Georgia, Alabama, Arkansas, and Missouri (first report).

In most of the states the disease was general in distribution but in Delaware and Georgia it appeared to be limited. Although the actual loss was slight the crop injury in many cases was high. In New Jersey from 1 to 50 or 60% of the crop was injured. In Virginia the infection ranged from 50 to 75%, which averaged for the state 30%. In Kentucky 1-2% loss is recorded. In Tennessee infection ran as high as 50%. In South Carolina it was about 15%.

It was noticed September 1, in Tennessee and September 15 in Missouri. Very little varietal resistance was noted although in Missouri Nancy Hall was not affected seriously.

Soft rot caused by Rhizopus nigricans Ehr.

Soft rot was reported found on sweet potato in the field and in storage in New Jersey, Virginia, South Carolina, Alabama and Arkansas.

Injury in the field in Virginia was about 3% and in South Carolina around 2%. In Arkansas the rotting in the field was severe, in some local sections practically all potatoes were destroyed.

Storage damage in Virginia amounted to about 75% of the crop in some places. In South Carolina it was very high. The approximate loss of the crop from soft rot in New Jersey was about 1%, and in Tennessee about 50,000 bushels were estimated lost. Below is given a summary of the losses from the disease in transit as found by inspection at the various markets.

Table IX. Percentages of Rhizopus decay as shown by market inspection during the season of 1918.

Origin of shipment	No. of cars with rot	Percentage of decay	Remarks as to seriousness of decay
Alabama	3	3 cars 5%	Decay irregular, some hampers no decay, others 25%.

Arkansas	2	1 car 1%	Over half of hampers with 2 to 6 decayed potatoes.
		1 " 23%	
California	1	20-30%	In all parts of load.
Delaware	32	2 cars 80-98%	Almost total loss.
		1 " 55%	Specimens at least half decayed.
		11 " 30%	Decay bad in all cars, some totally decayed stock.
		11 " 15%	Decay mostly slight, some bad decay in every car.
		7 " 5%	Slight decay.
Illinois	1	16-18%	Complete decay of affected stock.
Louisiana	3	2 cars 8-20%	Decay bad in both cars.
		1 car 0-50%	Some total decay, other potatoes half decayed.
Maryland	7	1 " 43%	Most specimens completely decayed.
		2 " 23-25%	Affecting entire potato.
		3 " 10%	Most affected stock worthless.
		1 " 5%	Slight in most cases.
Mississippi	1	5%	------
New Jersey	6	1 car 49%	Affected potatoes worthless.
		3 cars 20%	Bad decay in all cars
		2 " 25-30%	------
Oklahoma	1	2%	Slight decay
South Carolina	1	33%	Affected potatoes worthless.
Tennessee	3	2 cars 21-25%	Advanced stage.
		1 " 10%	Part slight, part bad.
Texas	3	2 " 2-5%	Slight.
		1 " 17%	Affecting half to entire area.
Virginia	4	10%	Decay irregular, some bad decay in each car.

White rust caused by Albugo ipomoeae panduranae Farl.

White rust was reported from New Jersey, Delaware, Maryland, Virginia, South Carolina, Georgia, Alabama, Porto Rico, Louisiana and Texas. It was not important commercially except in South Carolina where it was common and was said to have caused considerable loss.

Septoria leaf spot caused by Septoria bataticola Taub.

Septoria leaf spot was reported from New Jersey, South Carolina (first report), Alabama, Georgia, Louisiana (first report) and Texas (first report). Reported prior to 1918 from Arkansas, Iowa and Kansas.

No damage was reported.

Leaf spot caused by Phyllosticta batatas E. & M.

Leaf spot was general throughout the South. It was found in Virginia, South Carolina, Alabama, Mississippi, Louisiana, Texas, and Ohio (first report). There was some injury but little loss. It has never been serious enough to cause great damage.

Dry rot caused by Diaporthe batatatis (E.&H.) H. & F.

Dry rot was reported as common in New Jersey and present about Ocean Springs and Biloxi, Mississippi. In the latter section the injury ranged from 2 to 5% with an estimated loss in yield of less than 1%. The Porto Rico variety was affected in every case observed in Mississippi.

Root rot caused by Ozonium omnivorum Shear.

Root rot was reported from Texas where it was general and severe. It was one of the three most important diseases of the sweet potato in that state during 1918. The loss was apparently quite heavy, amounting to about 20% of the crop.

Other Diseases.

Blight caused by Sclerotium rolfsii Sacc. - Reported from Texas and Florida.

Root knot caused by Heterodera radicicola (Greef.) Mull. - Was reported present in Mississippi and Arkansas. In the southern half of Arkansas it was very severe, the crop injury amounting to about 10%.

Rot caused by Trichoderma koningi Oud. - Reported in 1918 from New Jersey where it has been common since 1915. It was reported present in Delaware from 1911 to 1916. This rot usually follows ring rot or soft rot causing further destruction of the already affected potatoes.

Java black rot caused by Diplodia tubericola (E. & E.) Taub. - Reported by J. A. Stevenson from Porto Rico in 1918. There happens to be no reports of its occurrence in the United States in 1918 although it was reported previously to the Survey.

Charcoal rot caused by Sclerotium bataticola Taub. - Reported in 1918 from Porto Rico. There are no reports in the Survey files of its occurrence in the United States during 1917 and 1918. In 1916, however, it was reported from New Jersey, Florida and Texas.

Rhizoctonia rot caused by Rhizoctonia sp. - Reported from Ellis County, Texas.

Dry rot caused by Schizophyllum alneum (L) Schrot. - Reported from Porto Rico.

Storage rot caused by a species of Fusarium - Quite common in Alabama on potatoes in storage during 1917 and 1918.

Stem and root rot caused by Nectria ipomoeae Hals. - Reported from Ohio.

An internal decayof undetermined cause was found in Lewis County, Washington, affecting sweet potatoes.

A leaf blight caused by Cercospora sp. was reported from Oklahoma. It was not causing any damage.

A purplish leaf spot of unknown cause was reported on slips at Vero, Saint Lucie County, Florida.

Chlorosis (non-parasitic) - Reported from Glascock County, Texas. J. J. Taubenhaus states that the disease resulted from the land being too rich in lime.

Growth cracking due to a rain which followed several weeks of drought was quite serious in Arkansas. In many fields the crop was rendered unmarketable except for local trade. Growth cracks on the tubers of Mississippi potatoes were seen in several cases. In one locality the cracking was probably due to excessive fertilizer in the form of stable manure. The tubers were not hurt for home consumption.

Drought injury occurred in Texas and Arkansas. In Texas it was one of the greatest drawbacks to the sweet potato crop during 1918. The total crop in Belle County was practically a total failure. The drought condition in Tarrant County also considerably reduced the yield.

DISEASES OF CRUCIFERS

CABBAGE

Club root caused by Plasmodiophora brassicae Wor

Club root in 1918 was scattered throughout the northeastern half of the United States. It was somewhat general in prevalence in the states where it appeared and was apparently worst in the extreme northeast. It was found in Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, West Virginia, South Carolina, Georgia, Ohio, Indiana, Illinois, Wisconsin and Washington. It was reported not to have been found in Kentucky, Mississippi, Louisiana, Oklahoma, Missouri, Kansas, Montana, Wyoming, Colorado, New Mexico and Nevada. In former years it has been reported from the Pacific Coast.

Club root was apparently of slight importance except in Pennsylvania where it produced a moderate amount of injury. In Vermont it caused a crop injury ranging from 10 to 15%. The loss was estimated at between 5 and 10%. In New York 2% of the crop was said to be injured. The loss was estimated at about 5,487 tons.

Yellows caused by Fusarium conglutinans Woll.

Yellows occur most commonly in the South and in a belt which includes many large commercial centers of products extending from Delaware, New Jersey and Pennsylvania through Ohio, Illinois and up through Iowa, the southern half of Michigan, and Wisconsin. The Plant Disease Survey holds no record of the occurrence of this disease in the New England States. Although probably occurring before 1918, it was not reported until then from Texas, Oklahoma, and Colorado. This is the first time it has been reported west of a line extending down the western boundary of Minnesota and intervening states to Louisiana, being new to Louisiana in 1916. It was reported from New York, New Jersey, Pennsylvania, Delaware, Virginia, West Virginia, Tennessee, South Carolina, Georgia, Alabama, Mississippi, Louisiana Texas, Oklahoma, Ohio, Arkansas, Indiana, Illinois, Wisconsin, Missouri, Kansas, Wyoming and Colorado. It was reported not to have been noticed in Maine, New Hampshire, Massachusetts, Connecticut, Kentucky, Montana, New Mexico, Washington, Nevada and California.

The disease seems to be on the increase in Pennsylvania, Tennessee, Alabama, and Louisiana. In Wisconsin there was less than usual. In Mississippi there was the usual amount. In New York the loss was very small. In Pennsylvania it was most serious in Cumberland and Perry Counties where the disease normally attacked plants when they were only a few weeks old. A 5% crop injury and a 2% loss are recorded. In Tennessee the crop injury ran as high as 75% with about a 5% loss. In Georgia the loss to summer cabbage was estimated as at least 25%. In Mississippi in individual cases the loss ranged from 10 to 75% with a probable average of 3 to 5%. The loss was slight in Louisiana, Texas, Wisconsin, Missouri and Nebraska. In Colorado the loss was about 10%.

Dates of first appearance of yellows 1918, according to collaborators:

April 4 .....Mississippi	June 1 .....Missouri
May 15 .....Tennessee	June 10 .....Pennsylvania
May 21 .....Georgia	June 10 .....Virginia
June .....Louisiana	June 26 .....New York

Late cabbages in the South are affected much more than the winter grown ones.

The wilt-resistant strain developed in Wisconsin continued to give good results both in that and in other states.

Black-leg caused by Phoma lingam (Tode.) Desmaz.

Black-leg has previously been found mostly in the North and East but during 1918 the disease was said to be well established in the South. There were no reports of it from states west of the Mississippi except for Arkansas and Louisiana, although it has been reported from the Pacific Coast in previous years. It was reported from Connecticut, New York, New Jersey, Delaware, Virginia, Tennessee, South Carolina, Alabama, Mississippi, Louisiana, Arkansas, Ohio, Indiana, Wisconsin, Minnesota, Missouri, and Kansas. It was said not to be found in Maine, New Hampshire, Massachusetts, Kentucky, Georgia, Florida, Oklahoma, North Dakota, Montana, Wyoming, and Colorado. It was found prior to 1918 also in Pennsylvania, West Virginia, Texas and Washington.

It was prevalent in New York, South Carolina, Alabama, Arkansas, Wisconsin and Kansas, while in the rest of the states it was local in occurrence and the losses were slight.

Savoy cabbage was found to be almost immune in New York.

Seed treatment with $Hg\ Cl_2$ was used by a few growers in New York. In Wisconsin there was strong evidence that seed disinfection did not eliminate black-leg entirely, especially where the fungus had penetrated the seed coat.

Black rot caused by Bacterium campestre (Pam.) E. F. Sm.

Black rot was found during 1918 in Massachusetts, New York, New Jersey, Pennsylvania, Delaware, Virginia, West Virginia, Tennessee, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Wyoming, and Colorado. It was reported not to have been found in Maine, New Hampshire, Kentucky, Oklahoma, Montana, Nevada and California. Prior to 1918 it was reported from the following additional states: Vermont, Connecticut, Arkansas, North Dakota, Nebraska, New Mexico, Arizona, Utah and Washington.

The disease was general in the states throughout the eastern half of the United States and was locally severe in New Jersey, Virginia, Tennessee, South Carolina, Georgia, Florida, Alabama and Minnesota.

In Pennsylvania the disease had not been seen before as serious as it was in 1918. One field lost 70% of the crop. In Kansas the crop injury ranged from 5% in Riley County to 25% in Lyon County.

Danish Baldhead in Pennsylvania was quite susceptible while Monmouth Red Rock was less so.

Poorly treated seed were considered responsible for the introduction of the disease into Minnesota and grasshoppers were apparently instrumental in the spread of the organism.

Root rot caused by Corticium vagum var. solani Burt.

Root rot was reported in 1918 from Pennsylvania, Ohio and Washington. It has had a wide range, having at one time or another been reported also from Florida, Alabama and Utah.

Reports indicate that at times it causes considerable damage in local areas.

Root knot caused by Heterodera radicicola (Greef.) Mull.

Root knot was found mostly in the southern states. It was present in Tennessee, South Carolina, Georgia, Texas, Arkansas, Ohio, Colorado and California. It was reported not to have been found in Maine, New Hampshire, Massachusetts, Connecticut, New York, West Virginia, Kentucky, Mississippi, Oklahoma, Indiana, Wisconsin, Minnesota, Missouri, Kansas, Montana, Wyoming, New Mexico, Nevada and Washington. Prior to 1918 it was reported found also in Pennsylvania, Virginia, Florida and Louisiana.

The disease was serious in South Carolina and very slight in Texas. It was worst on sandy soils.

Downy mildew caused by Peronospora parasitica (Pers.) De By.

Downy mildew was reported to the Survey from New York, West Virginia, South Carolina, Georgia, Florida, Louisiana, Texas, Ohio, Colorado and California. It was reported not found in Maine, New Hampshire, Massachusetts, Virginia, Kentucky, Mississippi, Oklahoma, Indiana, Minnesota, Missouri, Kansas, Montana, Wyoming, New Mexico and Nevada. It was found prior to 1918 in the following additional states: Connecticut, New Jersey, Pennsylvania, Tennessee, Arkansas, Wisconsin and Washington.

Slimy soft rot caused by Bacillus carotovorus Jones

Slimy soft rot was reported in the field from Pennsylvania, Virginia, Wisconsin and Minnesota and in shipments from Massachusetts, New York, Pennsylvania, Maryland, Kentucky, Tennessee, South Carolina, Florida, Alabama, Mississippi, Louisiana, Texas, Illinois, Wisconsin, Missouri and California.

The injury in the field was slight in Pennsylvania, Wisconsin and Minnesota, but was said to be severe in Virginia. Great losses were reported as occurring in shipments.

The inspectors of the United States Bureau of Markets at the various cities examined cabbage from the following states: Alabama (13 cars), California (4 cars), Colorado (5 cars), Florida (79 cars), Illinois (38 cars), Indiana (2 cars), Iowa (1 car), Kentucky (1 car), Louisiana (11 cars), Maryland (3 cars), Massachusetts (1 car), Michigan (4 cars), Minnesota (23 cars), Mississippi (9 cars), Missouri (3 cars), Nebraska (1 car), New York (106 cars), North Dakota (1 car), Ohio (6 cars), Pennsylvania (2 cars), South Carolina (2 cars), Tennessee (3 cars), Texas (7 cars), Virginia (10 cars) and Wisconsin (22 cars).

The largest number of cars with slimy soft rot originated in New York, 76 cars containing diseased cabbage. Of these cars 15 showed every head with some decay, 28 showed more than 50% affected heads, 8 averaged 25% infection and 25 cars ranged from 3 to 15% decay. There were some totally decayed heads in almost every car but in most cases the decay affected only from 3 to 5 outer leaves.

The second largest number of cars showing decay (37) came from Florida. In 8 of these cars 100% of heads showed some decay, 7 cars ranged from 40 to 90% affected heads, and 22 cars showed 5 to 25% decayed cabbage. Only a small percentage of total decay was found in each car.

Illinois cabbage was rather severely decayed, 35 to 100% of heads affected in the 29 cars from that state.

Several badly decayed shipments of cabbage were received from Alabama, Wisconsin, Virginia, Mississippi, and Louisiana. In most of these cars the rot involved from 3 to 10 outer leaves and there was some complete decay in every car.

The cabbage from the ramaining states showed varying degrees of decay, an occasional car with infection of every head.

Black mold caused by *Alternaria brassicae* (Berk.) Sacc.

Black mold was reported from Massachusetts, New York, Virginia, South Carolina, Georgia, Florida, Alabama, Louisiana, Texas, Ohio, Kansas, Wisconsin, and Washington. It has been rather common in South Carolina since 1909.

From the market inspectors' reports it is estimated that the greatest damage occurred while the produce was in transit and that there is not much damage from the disease while the crop is in the field. The early varieties appear to be affected most and especially those from the southern belt.

Inspection of 20 cars from Florida showed from 2 to 100% of cabbage with black mold, in most cases affecting outer 1 to 3 leaves.

Other diseases.

Rot caused by *Botrytis cinerea* was reported in four cars of cabbage from Florida. The average infection for the four cars was approximately 21%.

Damping off caused by *Pythium de baryanum* was reported from Pennsylvania where at Scranton it destroyed two million plants of different varieties. Prior to 1918 it was reported from Ohio.

Bacterial leaf spot caused by *Bacterium maculicolum* affected one field in New York in Madison County. No losses were suffered.

Drop caused by Sclerotinia libertiana Fckl. was reported from New York (Erie and Tompkins Counties', Alabama (Mobile County), Mississippi and Texas.

Wilt caused by Sclerotium rolfsii Sacc. was reported from Alabama where it was quite common. In Texas it was restricted in distribution and unimportant.

Malnutrition of cabbage was found locally in New York and Mississippi. As a rule it is restricted mostly to the southern states. Although the losses during 1918 from this trouble were apparently slight, in some years it is often large. The disease occurred most frequently in localities where mineral fertilizers were used. These fertilizers were used in order that a larger crop might be produced at an earlier date. No varietal resistance was reported.

Yellow leaf curl, a peculiar trouble of unknown cause, was reported from one farm in Alabama.

Oedema was common in a few fields in Cortland County, New York. No damage was done.

Calico or chlorosis was reported by J. C. Walker to have been found in Louisiana where it was affecting 30 to 50%of the plants in a local field which was broken in 1916 and had never before been planted to cabbage. Starting at one side of the field were 20 rows of Henderson's Succession variety, free from chlorosis; next were 20 rows of Early Summer also free. Next were 57 rows of Henderson's Succession, (plants from same seed bed as first lot of Henderson's Succession) showing 30 to 50% of plants badly affected with chlorosis. The grower said the field was all handled alike as to fertilizer, etc., and all planted at practically the same time.

CAULIFLOWER (See Cabbage)

CHARD

Leaf spot caused by Cercospora beticola Sacc., was reported from Missouri, Oklahoma (Local, found in September. The weather was unfavorable due to the heat and drought).

HORSERADISH

Black streak (cause undetermined) was reported from Washington.
Rhizoctonia caused by Rhizoctonia sp. was reported from Washington.

KALE

Rhizoctonia was reported from Pierce County, Washington, in 1918.

KOHL-RABI

Club root caused by Plasmodiophora brassicae Wor. was reported from Connecticut. Little injury occurred.

MUSTARD

Root knot caused by Heterodera radicicola (Greef.) Muller was found in Texas. Damage insignificant.

Club root caused by Plasmodiophora brassicae Wor., was reported from Texas. Damage negligible.

RADISH

White rust caused by Albugo candida (Pers.) Roussel was reported from Oklahoma, Indiana, Minnesota, and Nebraska. It was unimportant during 1918.

Downy mildew caused by Peronospora parasitica (Pers.) De By., was reported as local in Minnesota and causing only a trace of injury.

Rhizoctonia was found in Scioto County, Ohio.

Black rot caused by Bacterium campestre (Pam.) Erw. Sm. was found in Ohio.

Soft rot caused by Bacillus carotovorus Jones was reported occurring in New York and Maryland during 1918. In New York a trace was found on the Japanese radish. The entire contents of 20 baskets shipped from Maryland and examined at Buffalo, New York, were worthless.

TURNIP

Club root, caused by Plasmodiophora brassicae, was reported from Connecticut, Texas and Minnesota. In no case was it said to be serious.

Root knot, caused by Heterodera radicicola, was reported as general in sandy soils in Georgia, and was found locally in Texas.

White rust, caused by Cystopus candidus, reported in small amounts in Vermont.

Downy mildew, caused by Peronospora parasitica, was observed at Harlingen, Texas, May 7.

Soft rot, caused by Bacillus carotovorus, was reported occurring in slight amounts in the field in Wisconsin and Minnesota.

DISEASES OF CUCURBITS

CANTALOUPE

Leaf blight caused by Alternaria brassicae var. nigrescens.

Leaf blight was reported in 1918 from New Jersey, Dalaware, Maryland, Florida, Louisiana, Texas, Michigan and Missouri. Considering the reports of former years the range of disease includes the eastern states and Texas, Colorado, Utah and California.

The disease appeared to be less prevalent and active during 1918 than in 1917.

The greatest damage apparently occurred in Louisiana, where most of the crop was damaged, resulting in considerable loss. In Michigan this disease is the limiting factor in the growing of melons. In Missouri there was a 5% estimated local loss. During certain seasons this blight has been very destructive, especially 1905 in Maryland, Florida and Colorado.

Bordeaux has been suggested as a control as well as the practicing of rotation. The use of the latter is urged as severe attacks almost always follow if rotation is not practiced.

In Utah during 1905 it was noticed that hot, sunny weather, combined with conditions of irrigation, seemed to favor the disease to a large extent.

The rust resistant Pollack #25, put up by the Colorado Cantaloupe Growers Association, proved exceptionally resistant in Delaware during 1918. The chief difficulty observed in the resistant strains, however, was that there was a tendency to be late in fruiting and further a tendency to distribute the set of the fruit over a longer period, frequently holding the crops so late as to interfere with the use of the land for fall cropping or following crops.

Bacterial wilt caused by Bacillus tracheiphilus Erw. Sm.

Wilt was reported in 1918 from Massachusetts, New York, New Jersey, Pennsylvania, Delaware, Virginia, Kentucky, Tennessee, South Carolina, Georgia, Alabama, Texas, Ohio, Indiana, Wisconsin, Iowa, Kansas and Colorado. It was reported in former years also from West Virginia, Florida and Arkansas. It was reported not to have been found in Maine, New Hampshire, Mississippi, Oklahoma, Missouri, Montana, Wyoming, New Mexico, Nevada, Washington, and California last year.

The disease appeared to be more prevalent in 1918 than in 1917. Considerable injury was experienced in Virginia, Tennessee, Georgia, Alabama, and Ohio, while it was unimportant in New Jersey, Pennsylvania, Delaware and South Carolina.

Anthracnose caused by Colletotrichum lagenarium (Pass.) Ell. & Hals.

Anthracnose was reported in 1918 from Massachusetts, Pennsylvania, Delaware, Virginia, West Virginia, Kentucky, South Carolina, Georgia, Florida, Porto Rico, Indiana, Illinois, Wisconsin, Minnesota and Kansas. In former years it has been found also in Connecticut, New York, New Jersey, Tennessee, Arkansas and Colorado. It was reported not found last year in Maine, New Hampshire, Mississippi, Oklahoma, Missouri, Montana, Wyoming, New Mexico, Nevada, Washington

Considerable crop injury occurred in Pennsylvania (Estimated loss 3-4%), Georgia (10% injury in individual fields and 40% of melons in 2 cars inspected at markets showed anthracnose), and Minnesota (Estimated loss about 1%).

The Honey Dew melon was the most susceptible in parts of Georgia while other cantaloupes in the same fields were little affected.

Downy mildew caused by Pseudoperonospora cubensis (B. & C.) Rostow.

This disease was reported in 1918 from Massachusetts, New York, New Jersey, Virginia, South Carolina, and Colorado. It was found previous to 1918 in Connecticut, Pennsylvania, West Virginia, Kentucky, Georgia, Florida, Louisiana and Wisconsin. It was reported not to have been found in Maine, New Hampshire, Tennessee, Mississippi, Oklahoma, Indiana, Minnesota, Missouri, Kansas, Montana, Wyoming, New Mexico, Nevada, Washington, and California.

The prevalence in 1918 was somewhat less than in former years. In New Jersey and South Carolina it was common.

Sclerotium stem rot caused by Sclerotium rolfsii Sacc.

This disease was reported in 1918 from Georgia and Texas. Reported in former years from South Carolina and Ohio.

In Georgia the disease was local, producing about 10% crop injury in an individual field. This trouble may be quite common over the state, due to the fact that it is associated with the melon worm and the damage ascribed to the worm may often be done by this fungus.

Wilt caused by Fusarium vasinfectum Atk.

Fusarium wilt was reported from Delaware, Georgia, Mississippi, Ohio, and Minnesota. On the whole it was not prevalent except in Ohio where it was widespread. But for a local 25% injury in Georgia, the injury was slight.

Wilt caused by F. vasinfectum var. niveum was found during 1918 in New Mexico where it was as prevalent but less severe than in 1917. In Roosevelt County it became so serious that cantaloupe growing had to be practically abandoned.

Other diseases.

Root knot caused by Heterodera radicicola (Greef.) Muller was not reported in any state during 1918. Records of previous years show it to have been present throughout the South, (Tennessee, North Carolina, South Carolina, Florida, Alabama, Mississippi). Usually causes little injury.

Fruit rot apparently due to a species of Fusarium was reported from Maryland. It appeared in market gardens near Baltimore. It was present in the fields before the melons were gathered and spread rapidly after harvesting, greatly reducing the market value of the fruit.

CUCUMBER

Bacterial wilt caused by Bacillus tracheiphilus E. F. S.

This was probably the most serious cucumber disease last year, although mosaic ranked a close second. It was reported from sixteen states, mostly in the East, as follows: Massachusetts, New York, Pennsylvania, Virginia, Tennessee, South Carolina, Texas, Ohio, Michigan, Iowa, Wisconsin, Minnesota, Kansas, Colorado, Mississippi and Illinois.

In Michigan, Wisconsin, Minnesota and Kansas it was said to be too dry for the favorable development of wilt. In states further east, however, it was more destructive. Pennsylvania reported 3-5% crop loss, and Virginia called it the worst cucumber disease in the state. New York also reported damage in cucumber sections.

It was reported as first appearing in the field as follows:

June 10.....	Mississippi	August 7.....	Minnesota
July 9.....	Kansas	August 9.....	Pennsylvania

Mosaic (cause undetermined)

In 1918 mosaic was reported from the following states: Massachusetts, Connecticut, New York, Pennsylvania, New Jersey, South Carolina, Georgia, Mississippi, Louisiana, Texas, Ohio, Indiana, Michigan, Wisconsin, and Minnesota. A questionable report was also received from the state of Washington. In years previous to 1918 it has been reported from the additional states of Vermont, Rhode Island, Illinois, Iowa, Kansas, Colorado and California.

Mosaic seems to be increasing from year to year both in its range and destructiveness. In Wisconsin it is at the present time the limiting factor in the pickle industry. In Michigan cases were reported where the entire crop was ruined. In Pennsylvania a field of Davis White Spine variety having 75% affected vines was reported a failure. In Massachusetts from 10% to 75% loss was reported in the gardens about North Lexington and Springfield.

The disease was reported as first being noticed as follows:

May 4.....	Louisiana	July.....	Wisconsin
June 14.....	Minnesota	August 9.....	Massachusetts
July 14.....	Indiana	August 21.....	Pennsylvania

Anthracnose caused by Colletotrichum lagenarium (Pass.) Ell.& Hals.

Anthracnose was reported from Maine, Massachusetts, Pennsylvania, New Jersey, South Carolina, Florida, Alabama, Louisiana, Ohio, Wisconsin, Minnesota, and California. The report from California is the first received by the Survey from any state west of Colorado.

It occurred in less amounts than usual in the commercial pickle fields of Michigan, Wisconsin, and Minnesota. This was largely due to the extremely dry weather which, although reducing the damage from anthracnose, was in itself injurious to the crop.

In the New England States the disease occurred mostly or entirely in the greenhouses in May and June. It was reported for the first time for Maine in 1917 when it was present in greenhouse and fields in the vicinity of Portland. It was reported in 1918 from Louisiana in the vicinity of New Orleans where cucumbers were started under glass. Although not much damage to fruit

in the southern fields is reported, inspections of carload lots at some of the larger markets show a considerable amount of disease present in some of the shipments from the South.

The disease is reported as first appearing on the following dates:

May 15 (greenhouse)... Massahcusetts	June 29..... Minnesota
June (greenhouse)..... Maine	August 21.... Pennsylvania
June 28..... New York	August.....Wisconsin

Bordeaux misture (4-5-50) thoroughly and frequently applied was reported effective in Massachusetts and Ohio, and seed disinfection and crop rotation are proving satisfactory in Wisconsin.

Downy mildew caused by Pseudoperonospora cubensis (B. & C.) Rostow.

Downy mildew was reported from New York, New Jersey, West Virginia, South Carolina, Florida, Porto Rico, Ohio, Wisconsin and California.

It was most serious in the South, particularly in Florida and Porto Rico. In the former state perhaps 25% of the crop was affected but as harvest was practically over at the time when the disease was worst, little loss resulted. Spraying was effective in Florida when the application was thorough and timely.

Angular leaf spot caused by Bacterium lachrymans E. F. S. & Bryan.

Angular leaf spot was reported as follows: South Carolina (Local), Ohio, Louisiana (Slight amounts locally May 4), Wisconsin (Less than usual, weather too dry, first appeared in August), Michigan (Seen but apparently not common).

During years prior to 1918 it has been reported from the following additional states: New York, Connecticut, Virginia, Georgia, Florida, Alabama, Indiana, Illinois, Minnesota, Iowa and Colorado.

Scab caused by Cladosporium cucumerinum Ell. & Arth.

Scab was reported from Maine (Second case in thirteen years), South Carolina, Louisiana (Market inspection), Ohio, Wisconsin (Less than usual, scattered, reported August 30), and California.

Other diseases.

A root and stem rot, caused by Sclerotinia libertiana, was reported from Massachusetts (General in greenhouses and occasionally out of doors), New Jersey (Severe under glass due to failure to sterilize soil), and Ohio. This fungus was also found causing a rot of the fruit in carlot shipments from South Carolina, Texas, Illinois and other states. The decay ranged from slight to 90% of the contents of car.

Root knot, caused by Heterodera radicicola, was reported from Texas (Common) and Ohio.

Wilt, reported as being due to Fusarium sp., was severe locally in New Mexico and local in Ohio.

Stem rot, thought to be caused by Sclerotium sp., was found in Pennsylvania in a few places, notably in Erie County.

Rhizoctonia sp. was reported from Ohio and Washington.

Chlorosis was reported from King County, Washington.

Powdery mildew, caused by Erysiphe cichoracearum, was reported from Washington.

Dodder (Cuscuta sp.) was reported from Westchester County, New York, July 7.

PUMPKIN

Bacterial wilt, caused by Bacillus tracheiphilus Erw. Sm., was reported from Ohio.

Sterility, cause unknown, was reported from Washington.

SQUASH

Rot, caused by Alternaria sp., was reported from Washington.

Wilt, caused by Fusarium sp., was reported from Texas (Common, 40% estimated loss).

Root knot, caused by Heterodera radicicola (Greef.) Muller, was reported from Texas.

Downy mildew, caused by Pseudoperonospora cubensis (B. & C.) Rostow was reported from Porto Rico.

Sterility, cause undetermined, was reported from Washington.

Mosaic was reported from Texas as doing a large amount of damage to the crop locally, and from Connecticut.

Bacterial wilt, caused by Bacillus tracheiphilus Erw. Sm., was reported from Ohio and Colorado. In the latter state it was severe around Greeley where it did most damage in the gardens. Some fields were partially destroyed.

Scab, caused by Cladosporium cucumerinum Ell. & Arth., was reported from Maine.

Fruit rot, caused by Choanephora cucurbitarum, was reported from Massachusetts (General) and Porto Rico.

WATERMELON

Anthracnose caused by Colletotrichum lagenarium (Pers.) E. & H.

Anthracnose was reported from New Jersey, West Virginia, South Carolina, Georgia, Florida, Alabama, Oklahoma, Arkansas, Ohio, Indiana, Illinois, Iowa, Missouri, Arkansas and Kansas. Apparently the disease occurred in about the usual amounts although reports from Florida, Illinois and Kansas indicate that it was less abundant than normally in those states. In the latter state hot, dry weather in August was believe to be the cause of the small amount, at least about Manhattan.

The following field losses were reported: Arkansas, 2% crop injury; Georgia, 10% infection; Missouri, 25% crop injury; South Carolina, 10% injury, 2% loss.

The following table gives one an idea of the amount of anthracnose found on watermelons in cars arriving in city markets. It should be remembered that only a small percentage of cars are inspected and that of those inspected not all showed the presence of anthracnose.

Table X. Percentage of anthracnose as shown by examination of cars at destination by inspectors of the Bureau of Markets.

Origin of shipment	No. of cars with anthracnose	Percentage of anthracnose	Remarks
Delaware	1	---	Occasional melon spotted.
Florida	6	2 cars 85-93%	Advanced stage.
		4 " 9%	Mostly early stage, in small spots
Georgia	41	3 " 100%	From spots to entire surface of
		7 " 60%	melon covered.
			Usually in small spots.
Missouri	1	---	Badly specked.
North Carolina	3	2 cars 78-87%	Advanced stage, badly spotted.
		1 " 16%	Slight to bad.
Ohio	1	---	Occasional melon slightly spotted.
South Carolina	10	2 cars 100%	Advanced stage, deeply spotted.
		2 " 55%	Badly spotted, advanced stage.
		6 " 15%	Slight, early stage.
Texas	1	30%	20% bad, 10% slight anthracnose.
Virginia	1	42%	Badly spotted.
Origin unknown	15	4 cars 100%	Spots covering most of surface of
			melon.
		11 " 10-15%	Slight to bad.

End rot caused by Diplodia sp.

End rot was reported by collaborators from the following states:- Tennessee, South Carolina, Georgia, Florida, Mississippi, Louisiana, Arkansas, Missouri and Kansas. It was reported both as a blossom end and a stem end rot.

The loss in the vicinity of Manhattan, Kansas, was placed at 7-8%; in Missouri 5% of the crop was estimated injured; in South Carolina 5-10% loss was reported; and in Tennessee 10% damage is estimated. The following table represents losses in the lot shipment.

Table XI. Percentages of stem end rot as found by inspection of cars by the Bureau of Markets at the various northern markets.

Origin of shipment	No. of cars with stem end rot	Percentage of stem end rot	Remarks as to seriousness of decay
Delaware	1	4%	--------
Florida	11	1 car 58%	20% complete decay, 38% slight.
		4 " 33%	Decay slight in most cases.
		6 " 10%	Mostly slight.
Georgia	56	12 " 57%	Very heavy decay, some worthless.
		10 " 28%	Decay frequently had progressed.
			4 inches from stem.

Origin of shipment	No. of cars with anthracnose	Percentage of anthracnose	Remarks
		34 cars 6%	Slight, early stages.
Missouri	6	1 " 35%	
		5 " 13%	
North Carolina	3	9%	Early stage, not yet leaking.
Ohio	1	---	Early stage.
South Carolina	10	8 cars 15%	Decay heavy in 1 car only.
		2 " 6%	
Texas	4	1 " 50%	Most melons completely decayed.
		1 " 33%	Well developed, bad decay.
		2 " 12%	Well developed.
Virginia	1	40%	Varying from slight to bad decay.
Origin unknown	25	1 " 100%	Well advanced stage.
		6 " 30%	Well developed.
		18 " 8%	Mostly slight, some bad decay.

Wilt caused by Fusarium vasinfectum.

Wilt in 1918 was reported from Maryland, Virginia, Tennessee, South Carolina, Georgia, Mississippi, Louisiana, Texas, Indiana, Missouri and New Mexico. It was general throughout Georgia and New Mexico (Only watermelon disease in the state). It was scattered in Virginia and in Missouri it was general in the southeastern section of the state. In the remaining states the disease was local in occurrence.

The losses were very severe in Texas (30%). In Georgia the crop injury was about 25% with an estimated loss of 5%; in South Carolina the injury was 5% and loss 1%; in Indiana locally very severe; in Missouri about 10% crop injury.

Rot caused by Fusarium spp.

A Fusarium rot was reported from Kansas. The greatest damage to the melon crop in the state was said to be caused by this trouble wherever melons were grown commercially. The losses ranged from 3-33% but ranged on the average between 10-12%.

Other diseases.

Bacterial wilt, caused by Bacillus tracheiphilus, was reported from South Carolina. The occurrence was local.

Leaf spot, caused by Cercospora citrullina, was reported from Texas and Santo Domingo.

Downy mildew, caused by Pseudoperonospora cubensis, was reported from South Carolina (local).

Alternaria leaf spot, caused by Alternaria sp., was observed in Georgia, Louisiana and Ohio, of slight importance in each case.

Blight, caused by Sclerotium rolfsii, was reported from South Carolina.

Nematode caused considerable damage in local fields in Texas and

Dry weather was the limiting factor in Arkansas for the growing of watermelons.

Frost injury was reported from Florida as slight.

DISEASES OF MISCELLANEOUS CROPS

ARTICHOKE

Blight, caused by Sclerotium rolfsii Sacc., was found in many home gardens throughout Georgia during 1918. In patches where the disease occurred all the plants were usually destroyed. One garden in the vicinity of Athens had been planted in 1917 to Spanish peanuts which developed about 25% wilt (Sclerotium rolfsii). Artichokes planted on the same area in 1918 were destroyed. The loss for the state was a trace. The trouble was noticed July 1.

Rust, caused by Puccinia helianthi, was abundant on wilt artichokes growing along the Monongehala River in Monongalia County, West Virginia. Some was also found on cultivated plants in the same county.

A brown rot, caused by Botrytis sp., was found in 2 cars of artichokes inspected at Buffalo which had been shipped from California. There was about a 41% infection, with many boxes entirely worthless in one car while the infection in the second car ranged from 10 to 75%.

ASPARAGUS

Rust caused by Puccinia asparagi DC.

The only disease which affected the asparagus crop to any extent, and then only moderately, was rust. It appeared scatteringly from the Atlantic to the Pacific Coast and from the northern to the southern states.

It was reported from Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, West Virginia, Kentucky, South Carolina, Georgia, Texas, Indiana, Illinois, Wisconsin, Minnesota, Missouri, Kansas, Washington and California. It was reported not to have been noticed during 1918 in the following states: Virginia, Tennessee, Louisiana, Montana, Wyoming, Nevada, and Oregon. In previous years it has been reported also from Maine, New Hampshire, Mississippi, Oklahoma, Arkansas, Missouri, New Mexico and Washington.

In Massachusetts there was a probable loss of 2%. The resistant varieties (Washington) developed by the United States Department of Agriculture was reported everywhere as giving fine results.

Other diseases

Fasciation was reported as doing some damage but causing very little loss in Connecticut. Growers in California have experience trouble from the same source in the past. Some growers there have testified that there was a greater percentage of fasciated shoots in their beds during the period

when the first stems pierced the soil, especially after a cold winter. Doubtless this has appeared in other sections of the country but the producer or grower merely looked upon it as an abnormality, and as it may not at times affect the selling value, when appearing slightly, it has gone unreported. It has been suggested that over manuring and too much moisture at the early growing season may induce fasciation.

Rhizoctonia was reported from Pennsylvania (local) and Washington (Of slight consequence).

BEET (Garden)

Scab, caused by Actinomyces chromogenus Gasp., occurred locally in Vermont, Connecticut, New York, Ohio, and Washington. The disease was of slight importance in these states. In Vermont, however, 25% of the beets were reported scabby.

Leaf spot, caused by Cercospora beticola Sacc., was general in New York, New Jersey, South Carolina, Texas, Ohio, Minnesota, and Colorado. It appeared in slight amounts in Connecitcut, West Virginia, Georgia, Porto Rico, Oklahoma, and Missouri. Considerable injury was reported from New York, South Carolina, Georgia, and Colorado.

Rot, caused by Sclerotinia libertiana Fckl., was reported from Illinois.

Root knot, caused by Heterodera radicicola (Greef.) Muller, was reported from Texas where it occurred locally and in slight amounts.

Curly top was reported from Nevada and Washington.

A strikingly peculiar leaf spot, the cause of which was undetermined, was reported by L. R. Hesler to have been found May 2 in a field near Austin, Texas.

CARROT

Soft rot, caused by Sclerotinia sp., was found in certain localities in Pennsylvania where the crop was stored in trenches (75% loss) and where the roots were set out in the field to develop seed (25% loss). Appeared April 17 in Philadelphia County.

Rot, caused by Sclerotinia libertiana Fckl., was the cause of considerable decay of root and tops in transit according to reports of inspectors of the Bureau of Markets.

Gray mold, caused by Botrytis sp., was found in Pennsylvania where a 10% loss occurred locally on stalks of seed carrots. The tops turned brown, died and then Botrytis developed. It was reported July 17. It was also found at Pullman, Washington.

Corticium vagum, var. solani Burt, was found in New York wherever carrots were grown. Also found in Pierce County, Washington.

Soft rot, caused by Bacillus carotovorus Jones, was reported found in Massachusetts (general), Mississippi, Louisiana, Oklahoma (trace found in October) and Minnesota (trace).

CASTOR BEAN

Gray mold caused by Botrytis sp.

According to H. E. Stevens, this recently introduced disease is very serious on castor beans in Florida. It was evidently brought in on the seed. Subsequently it was distributed over the state, and since a large acreage has been given over to the raising of castor bean recently the disease has become very prevalent. At least 50% of the crop was destroyed last year.

It appeared during the rainy season and rapidly became epidemic in the fields. Under moist conditions the disease makes rapid progress and practically all fruiting heads on a plant that were not nearly mature when the disease appeared were quickly destroyed by it.

Practically all varieties are susceptible, varieties which mature early or ripen their seeds before the spring rains escape.

No ordinary methods of control seem to be of any use, the only possible means at present is the planting of early maturing varieties.

Other diseases

Root rot due to an excessive amount of alkali in the soil caused considerable loss on a farm near Laredo, Texas. The beans either failed to make growth or died after attaining some growth. On the outside area of the main alkali spot the plants would grow and sometimes attain a height of 10 to 15 feet but in such instances they would go all to vines and produce no seed.

Texas root rot, caused by Ozonium omnivorum Shear, was common in Texas where it produced an estimated loss of about 2%.

Leaf spot, caused by Cercospora ricinellae, was reported from Santo Domingo where it was of minor importance.

CELERY

Late blight caused by Septoria petroselini Desm. var. apii Br. & Cav.

In 1918 late blight occurred in New Hampshire, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Virginia, South Carolina, Florida, Texas, Ohio, Illinois, Missouri, Michigan, Wisconsin, North Dakota, Montana, Colorado, Utah, Washington and California. It was reported as not being found in Tennessee, Georgia, Mississippi, Oklahoma, Wyoming and Nevada. The disease was found prior to 1918 in the additional states of Maine, West Virginia, Kentucky, Louisiana, Arkansas, Indiana, Minnesota, Missouri, Kansas and Oregon. South Carolina and Missouri reported the finding of late blight for the first time.

Late blight seemed to be somewhat less prevalent during 1918 than in 1917. The losses were also correspondingly fewer. In Massachusetts it was general and especially severe in the eastern part of the state where there was a 10% loss. In New Jersey it was abundant and the cause of considerable loss in some localities. In Pennsylvania the loss was about 5%.

In Missouri there was a 25% injury to the celery crop in Boone County. In Michigan it was less than usual, with only a trace lost. In Colorado late

blight was rather prevalent and the greatest losses occurred in Pueblo and Fremont County.

Michigan reported that in 1915 the loss from late blight of celery amounted to probably more than one million dollars. In California (1908) the estimated loss in money was $550,000 and in quantity 1950 carloads.

Golden Self Blanching and Giant Pascal were quite susceptible to the disease in Massachusetts, while in Pennsylvania the same held true for Golden Self Blanching. Easy Blanching was much more resistant.

Bordeaux mixture has been successful in most cases as a means of control. According to J. E. Howitt, of Canada, the results of five years experimentation showed Bordeaux mixture (4-4-40) to be effective. Spraying is commenced when the plants are in the seed bed and continued at intervals of a week or ten days, or even twice a week, if necessary. It is said that this can be continued within two or three days of the time when the celery is to be harvested, as the subsequent washing removes the fungicide.

Early blight caused by Cercospora apii Fr.

Early blight was apparently less prevalent and caused less injury in 1918 than in 1917. The disease was present in Vermont, Massachusetts, Connecticut, New York, New Jersey, South Carolina, Florida, Michigan, Minnesota, Colorado and Utah. The disease has been reported at some previous time from Maine, West Virginia, Kentucky, Arkansas, Indiana, Missouri, North Dakota, Kansas and California.

The chief loss was through reduction in market value due to blighted leaves and probably through reducing the keeping qualities during transportation. In Vermont all the early varieties were reported affected. In Massachusetts the disease was much less severe than in 1917, about a 4% loss. In New York, Michigan, Colorado, and Utah it was unimportant. In Connecticut there was considerable loss. In New Jersey it was abundant and considerable loss resulted. It was general in Florida and the most conspicuous disease seen there by L. R. Hesler while making a survey of the crop diseases from March 12-31. It was found in all celery regions of the state visited. It often browned whole fields. In Minnesota the loss was below 1%. Michigan and Utah had only a trace.

Varietal susceptibility was manifested by the Salzer Easy Blanching and the Golden Self Blanching in Connecticut.

Bordeaux gave good results in Massachusetts, New York and New Jersey. It is practiced in Florida but in the majority of cases it did not seem to hold the fungus in check.

Foot rot caused by Sclerotinia libertiana Fckl.

Foot rot was reported found in Massachusetts, New York, New Jersey, Florida, Michigan, Ohio, Utah and California. In Massachusetts it did not appear until after boarding for blanching, and in Michigan it appeared as a trench rot. There is given below a table showing the amount of rot, thought by inspectors to be due to Sclerotinia, which was found on celery in transportation.

Table XII. Percentages of watery soft rot as shown by inspection of cars by the Bureau of Markets.

Origin of shipment	No. of cars with decay	Percentage of decay	Remarks as to seriousness of decay
California	5	2 cars 80%+	Slight to bad, 25% total decay in 1 car, balance slightly decayed.
		3 " 50%	On outer branches in all cars.
Colorado	1	---	Occasional stalk showing white mold.
Florida	9	1 car 100%	Badly decayed.
		1 " 50%	Slight in some crates, celery in other crates worthless from decay.
		4 " 20%	Celery in top layers badly decayed, slightly less at bottom of load.
		3 " 5%	Generally slight decay.
Illinois	1	---	Top layer worthless, balance slight.
Michigan	4	2 cars 100%	Slight in 1 car. Decay entering heart of bunches in the other car.
		2 " 10-20%	Affecting 1 to 4 leaves per stalk.
New York	4	2 " 100%	Bad decay in all stalks.
		2 " ---	Affecting occasional stalk.

Bacterial rots

Various rots caused by bacteria were reported on celery in the field in various states. Crown rots were reported from Massachusetts, New Jersey, and Missouri. Heart rot was reported from Massachusetts. Root Rot (New Jersey), and soft rot (Michigan, Ohio, Porto Rico), were also reported. In Massachusetts Osmun and Krout report that celery is almost a complete failure on some farms because of the severity of crown rot and heart rot. Growers are substituting other varieties for the Golden Self Blanching because of the susceptibility of this variety to the diseases. The new Easy Bleacher in Massachusetts is almost immune. In Missouri Golden Self Blanching was severely affected with a soft crown rot, while varieties Pascal and Winter Queen were not affected. In Michigan Easy Bleacher was reported as showing 6% bacterial soft rot in one field.

Bacterial leaf spot (cause undetermined)

This leaf spot was only reported with certainty from New York and Michigan. The disease was general in both of these states. In New York it occurred practically everywhere celery was grown, especially in the western part of the state, while in Michigan, all the yellow celery, particularly the Golden Self Blanching, seemed to be affected. It was estimated that on account of the excessive trimming of the leaves required in Michigan 5% loss of the susceptible variety occurred. Spraying with Bordeaux gave excellent results in New York.

Black heart (Cause undetermined).

Black heart was reported from Florida, Louisiana, and California. In Florida traces were noted at Plant City, Bradentown and Manatee, and a heavy outbreak was observed at Sanford. From estimates made in the field during harvest at Sanford it was found that about 20% of the bunches had to be discarded as non-marketable on account of black heart. Certain shipments of celery from California into Huston, Texas, showed an advanced stage of black heart. One car of New York celery showed 100% black heart. Florida celery was less decayed, about 12% affected hearts. In a car of celery of unknown origin 30% of the bunches were affected by black heart.

Slimy soft rot caused by Bacillus carotovorus and related bacteria.

Slimy soft rot was a common disease of celery in transit. The accompanying table shows the results of market inspection.

Table XIII. Percentages of slimy soft rot of celery as determined by market inspection of car loads, 1918.

Origin of shipment	No. of cars with decay	Percentage of decay	Remarks as to seriousness of decay
California	3	1 car 66%	A mass of decay in upper part of stalks and leaves.
		1 " 53%	Decay varying from slight to bad.
		---	Decay varying from an occasional stalk in bottom layer to 50% in top.
Florida	8	1 car 50%	Very heavy decay at top of load.
		1 " 33%	Decayed in stalk and leaking badly.
		4 " 15%	Some decay extending into heart.
		2 " 5%	Decay in outer stalks and tops.
Kentucky	1	---	Top layer worthless, decay less in lower layers.
Michigan	5	1 car 100%	Slimy decay of leaves and tops of stalks.
		4 cars 25%	Decay very heavy in top layer of crates, slight at bottom of load.
New York	4	2 " 25%	Heavy decay in upper 2 layers of crates, less in lower layers.
		2 " --	Occasional decayed stalk.
Ohio	1	25-100%	Much total decay at top of load, occasional decayed stalk at bottom.
Pennsylvania	1	35%	Decayed stalks black at heart.

Other diseases

Rhizoctonia was unimportant. It appeared in Massachusetts at various times and also in Ohio and in Washington (Moderately severe in Pierce County).

Root knot, caused by Heterodera radicicola (Greef.) Muller, was reported from Reno County, Kansas, as severe.

Mosaic was reported by W. L. Doran to have been found by him while visiting market gardens in Massachusetts in September, 1918.

Soft rot, probably caused by Botrytis sp., was reported from Pennsylvania. It was very severe on a carload of bunched celery in crates.

Drought injury caused the greatest damage to the celery crop in Wisconsin. The garden crop was very small.

Scab, caused by Phoma apiicola Speg., was recorded on celery from Ohio.

Leaf spot, caused by Phyllosticta sp., was found in Porto Rico. The case reported occurred where soil conditions were unfavorable for satisfactory growth of the host.

EGGPLANT

Fruit rot caused by Phomopsis vexans (Sacc. & Syd.) Harter.

During 1918 fruit rot was reported from New York, New Jersey; Tennessee, Georgia, Florida, Porto Rico, Mississippi, Louisiana, Texas, Oklahoma, Ohio, Illinois, Wisconsin, Iowa, and Missouri. Four states reported the disease for the first time to the Survey (Tennessee, Georgia, Iowa, and Missouri). In years previous to 1918 Phomopsis fruit rot has been reported from the following additional states,- Connecticut, Pennsylvania, Virginia, West Virginia, Kentucky, and Arkansas. Negative reports of occurrence in 1918 were received from the following states,- Maine, New Hampshire, Massachusetts, South Carolina, Minnesota, Kansas, Montana, Wyoming, Colorado, Nevada, Washington and California. So far it has not been reported from the West.

When reports of former years are combined with those of 1918 three main regions of infestation stand out rather prominently. (1) The section along the Atlantic Coast from New York to Virginia. (2) The group of Southern and Gulf Coast States from Georgia and Florida westward to Oklahoma. (3) The strip of Central States from Ohio to Nebraska.

The greatest losses seem to have been experienced in New Jersey, Virginia, Florida, Alabama, and Louisiana.

Resistant varieties have not been reported. In Pennsylvania in 1917 the Black Dinah was seriously affected.

According to reports no real successful control measures are available. Bordeaux was reported in 1915 as giving good results in New Jersey but apparently it was not satisfactory in Virginia or Louisiana. Seed disinfection, soil sterilization, and crop rotation are recommended in Florida.

Bacterial wilt caused by Bacillus solanacearum E. F. Sm.

This disease caused some loss during 1918 and seemed to be quite local in distribution, being reported only in Pennsylvania, Porto Rico, and Texas. In Pennsylvania it was general, where the crop was grown producing an estimated loss of 10%. In Porto Rico it was the most severe eggplant disease of the year, and in Texas also it was the greatest drawback to the eggplant crop. The variety Beauty was reported very susceptible

Leaf spot caused by Alternaria sp. or Macrosporium sp.

This leaf spot was found in 1918 at Eden, Erie County, New York, where it appeared May 13, killing most of one of the grower's seedlings. It was also reported locally from Kansas, September 13, but was of little consequence.

During 1908 specimens were collected in a small field at Kenilworth, Maryland, where the disease was quite prevalent on the lower leaves of most of the plants in the field. In 1916 it was reported from Prince George County, Maryland. In 1915 it was reported from Wisconsin, and in 1916 again from the same state where it caused serious injury to the seed beds at Eau Claire.

Verticillium wilt caused by Verticillium sp.

Wilt appeared to be limited in distribution to the Atlantic Coast Region from New York to Georgia. It caused considerable injury and loss wherever it appeared.

It was present in Massachusetts, New York, New Jersey, Virginia, South Carolina, and Georgia. Reported not to have been noticed in Maine, New Hampshire, Pennsylvania, West Virginia, Tennessee, Florida, Mississippi, Louisiana, Arkansas, Indiana, Wisconsin, Minnesota, Missouri, Kansas, Montana, Wyoming, Colorado, Nevada, and Washington. A similar disease has been found previous to 1918 also in Connecticut, Kentucky, Texas and California.

Other diseases

Dodder (Cuscuta sp.) An interesting case of dodder parasitism was reported from Pennsylvania. It appeared on an eggplant crop in a large patch planted on new ground which previously had been wooded. The plants were dwarfed and produced no fruit. In one case reported there was a 50% loss.

A report in 1908 from Virginia states that an entire crop was lost from the same cause.

Root knot, caused by Heterodera radicicola (Greef.) Muller, was reported from South Carolina where it was found in Florence, Charleston and Beaufort Counties. In Texas a 5% loss occurred on a truck farm in the vicinity of Fort Worth.

Crown rot, caused by Sclerotium rolfsii Sacc., was observed in Porto Rico during 1918. It caused some damage. It was reported also in 1916 in Tangipahoa Parish, Louisiana.

Fruit rot, cause undetermined, was reported from Florida in the form of an Alternaria-like spot on the fruit. Spots were about 1/2" in diameter, raised, hard, and with conspicuous concentric rings. The disease was observed in markets on March 19 and at Jacksonville on April 8.

Fusarium wilt, caused by Fusarium sp., was reported from Georgia and New Mexico (Slight loss in Dona Ana County).

Root rot, caused by Rhizoctonia sp., was reported from New Jersey where it was severe and destructive in some plantings.

GANDUL

Leaf spot, caused by Cercospora cajani P. Henn., was common in Porto Rico.

Pink disease, caused by Corticium salmonicolor B. & Br., was reported from Porto Rico.

HORSE BEAN

Stem rot, the cause of which was uncertain, was reported from Washington.

Leaf spot, cause undetermined, was reported from Washington.

LETTUCE

Drop caused by Sclerotinia libertiana Fckl.

Drop was apparently the worst disease of lettuce during 1918. It was found wherever the crop was grown. It was reported severe and prevalent in Massachusetts, the South Atlantic States, Arkansas, Iowa and Oregon. Traces were observed in Mississippi, Texas and Colorado.

In Pennsylvania the early summer crop seemed to escape the disease to some extent but the late crop was severely hit bringing about an estimated loss of about 25%. In Massachusetts during the winter and early spring it was severe in the greenhouses where in some houses 50% of the crop was ruined; one house was practically a total failure. The average loss of the greenhouse crop ranged from 8-10%, while in a few instances the out-door crop was severely injured. The total loss was not over 2%.

In New Jersey, L. M. Massey found this disease on the coast farms in Bergen County where in some cases the loss was 25%.

In Florida during the early part of the season, when the weather was somewhat dry and exceptionally cool, drop was less troublesome than in seasons past but in December numerous fields showed a considerable percentage of affected heads.

In the greenhouses at Des Moines and Muscatine, Iowa, Sclerotinia was very destructive.

The Blue Ribbon was especially susceptible to drop in New York while in the same state May King was not so badly affected.

Gray mold rot caused by Botrytis cinerea Pers.

In 1918 gray mold was reported from Massachusetts, New York, Pennsylvania, Arkansas and Ohio. Apparently the amount of loss was higher and the disease was more prevalent than in 1917. In New York as high as 9% was found in one field but on the whole it was less serious than 1917, the average infection for the state being not over 2%. In Ohio it was observed to be very bad on head lettuce, destroying 98% of the plantings in a Cleveland garden. In was found to be general in greenhouses throughout Massachusetts where a 1% loss was estimated. In parts of Pennsylvania

a loss of about 20% occurred. The growers did not appear to take the disease seriously, two fields suffered 48 and 60% respectively. In Arkansas a 5% loss was reported.

Downy mildew caused by Bremia lactucae Regel.

Downy mildew appeared in slight amounts in Massachusetts, Pennsylvania, Arkansas, Ohio, Iowa, Oregon and was severe locally in New York. It occurred for the most part in the greenhouses although some was found in the field.

Control of growing conditions are recommended by collaborators in Massachusetts and Ohio. In the latter state eradication measures and steam sterilization have been used with success.

Stem rot and rosette caused by Rhizoctonia sp.

Stem rot was found scattered throughout the eastern and southern United States in 1918. In the head-lettuce section about Baltimore, Maryland, examinations showed from 1-5% stem rot. In the Sanford section, Florida, a decay which started on the lower leaves where they rested on the ground and which gradually worked up into the head, caused noticeable losses. It made some heads entirely useless while others through necessary trimming were reduced in size. In New York the same decay caused losses perhaps greater than those in the Sanford truck section of Florida yet it was less severe during 1918 than 1917. In Pennsylvania it is generally prevalent causing a loss of about 2%. It was reported as unimportant in Texas and not found in Mississippi.

Rosette was general in Pennsylvania and caused a loss of about 5%. The disease is overlooked to quite an extent because the plants may grow out of the typical rosette symptoms. At State College it was perfectly controlled in the greenhouses by steam sterilization. The disease was less serious in New York than in 1917 as the actual loss was small in most of the fields.

Tip burn (non-parasitic)

In 1918 tip burn was reported from Massachusetts, Pennsylvania and Louisiana. In Massachusetts it was common and serious in greenhouses. In Pennsylvania it appeared in Alleghany County where it produced a 20% loss to the crop. In Louisiana, J. C. Walker reported that in the New Orleans section in May the disease became very serious just as the lettuce was to be cut. It was probably brought on by the warm weather which prevailed at that time. There were no reports of the disease during 1917 to the Plant Disease Survey but has been reported in former years from Pennsylvania, Maryland and Ohio.

Rio Grande Disease (cause undetermined)

Rio Grande disease was reported by J. C. Walker May 9, 1918 as occurring in Louisiana. Later Walker and Gardner observed it in the Chicago market gardens where it occurred locally in slight amounts.

Other Diseases and Injuries Reported in 1918.

Shot hole, caused by Marssonia panattoniana (Berl.) Mag. - New York.

Fusarium sp. - Ohio.

Root knot, caused by Heterodera radicicola - Arkansas, Florida and Ohio.

Leaf spot, caused by Septoria lactucae Pass. - Arkansas, Florida, Mississippi, New York, Pennsylvania.

Brown mold - Pennsylvania.

Damping off - New Jersey.

Firing, (probably bacterial) - Pennsylvania.

Leaf spot, caused by Cercospora lactucae Stevenson - Porto Rico.

Head rot - Tennessee.

Bacterial leaf rot - Texas and Ohio.

Soft rot, bacterial - Pennsylvania.

Slimy soft rot, caused by Bacillus carotovorus Jones - Alabama, California, Colorado, Florida, Illinois, Kentucky, Louisiana, Maryland, Missouri, New York, Ohio, Pennsylvania and South Carolina.

LIMA BEAN

Pod blight, caused by Phoma subcircinata E. & E., was reported from Georgia. It made its appearance in certain localities, destroying from 20 to 25% of the crop in some cases. When dry weather came on the disease appeared to abate.

Pod blight, caused by Diaporthe phaseolorum, occurred in Alabama where it was common and caused complete losses at times in some localities. Found in gardens only.

Rust, caused by Uromyces appendiculatus (Pers.) Lev., was reported from Ohio and California. In Ohio it was rather abundant. In California it was said to be severe and caused considerable loss.

Anthracnose, caused by Colletotrichum lindemuthianum, was present in Pennsylvania. It appeared to chiefly attack the leaves. There was only a slight loss.

Bacterial blight, caused by Bacterium phaseoli E. F. Sm., was reported from Georgia.

Leaf spot, caused by Phyllosticta phaseolina Sacc., was observed in Michigan in Branch and Ingham Counties. It was of minor importance.

Mildew, caused by Erysiphe polygoni D.C., was reported from California and Porto Rico. In California it is one of the main pathological problems of the bean growing sections around Ventura and Santa Barbara Counties and other bean sections of the central and southern portions of the state. Also considerable mildew is found along the coast.

Downy mildew, caused by Phytophthora phaseoli Thax., was reported from Pennsylvania and Virginia. In Pennsylvania it was less prevalent in 1918 than 1917 and caused some slight loss. In Virginia it was severe locally in Montgomery County where about 50% of the crop was injured.

Root knot, caused by Heterodera radicicola (Greef.) Muller, is one of the important bean troubles in California.

Root rot, caused by Ozonium omnivorum Shear, was severe on lima beans in Texas during 1918. The speckled lima bean was especially susceptible.

Fusarium sp. was reported from California. It was common in Orange County. In Huntington Beach district it was very severe.

Mosaic was reported from Pennsylvania and Texas.

Root rot, caused by Rhizoctonia sp., was present in Pennsylvania. It was somewhat general, producing severe loss on the bush limas which are much more susceptible than wax or string beans.

Leaf spot, caused by Cercospora carbonens Ell. & Mart., was reported from Porto Rico where it was common.

Gray leaf spot, caused by Isariopsis griseola Sacc., was reported from Porto Rico.

MANGEL

Leaf spot caused by Cercospora beticola was reported from Minnesota. Generally distributed but producing a trace of injury.

Leaf wart, cause unknown, was reported from Washington.

OKRA

Wilt caused by Verticillium sp. was common in New Jersey wherever okra was grown. It probably produced about a 2-3% reduction in the yield.

Root rot caused by Ozonium omnivorum Shear was common in Texas. The estimated loss for the state was about 30%.

Root knot caused by Heterodera radicicola (Greef.) Muller was reported from Georgia. The trouble was general, prohibiting growth in some sections, nevertheless the estimated loss for the state was small.

Leaf spot caused by Cercospora hibisci T. & Earle was reported from Porto Rico by J. A. Stevenson, where it was common and destructive.

Blossom blight caused by Choanephora cucurbitarum (B. & Br.) Thaxter was reported from Porto Rico.

Rhizoctonia injury was found in the Mobile section, Alabama, where it was common in one field.

Leaf spot possibly caused by Alternaria was found on okra at Vero, Florida.

PARSLEY

Drop caused by Sclerotinia libertiana Fckl. was reported as causing 2% reduction in yield at the Virginia Truck Experiment Station.

PARSNIP

Diseases caused little loss to the parsnip crop during 1918 judging from the very small amount of trouble reported.

Soft rot caused by Bacillus carotovorus Jones was general and moderately severe in Massachusetts, causing about a 2% loss. In Minnesota but a trace of it was found.

Early blight caused by Cercospora apii Fr. occurred locally in Chittenden County, Vermont, and was responsible for about 50% injury to the local crop.

A trouble which was very similar to mosaic appeared in a garden August 12 at Ithaca, New York.

PEA

Blight caused by Mycosphaerella pinodes Berk. & Blox., = Ascochyta pisi Lib.

Ascochyta pisi was reported present in Maine, Massachusetts, New York, New Jersey, Pennsylvania, Maryland, South Carolina, Mississippi, Louisiana, Arkansas, Ohio, Wisconsin, Montana (found for the first time), Washington and California. In general little loss was incurred. In New York the disease was common in all canning sections but as the spotting appeared late there was slight injury. There was, however, a 2% loss in Pennsylvania. In Wisconsin the variety Admiral was most susceptible. In that state growers are using rotation and clean seed with good results.

The following dates show when the disease was first noted in various states in 1918.

April	Louisiana	July 30	Pennsylvania
June 26	New York	July	Montana
June	Wisconsin		

Bacterial blight caused by Bacterium pisi Sackett.

Bacterial blight was found in Wisconsin, Montana and Colorado. It was about as usual in Wisconsin and Colorado but more prevalent and severe in Montana. Bacterial blight (undetermined, and which may be caused by Bacterium pisi) was general on the early crop of peas in Wisconsin and produced some loss. Dry weather at the time of the late crop served to lessen the injury.

Bacterial blight is the most important disease of peas in Montana being found everywhere the crop is grown. In 1918 there was more than the average amount. The average loss for the state is estimated at 2%. A few fields were completely devastated and ahigh percentage of injury around Bozeman is reported. In general the coarse strawed varieties were not so extensively damaged as were the early "short strawed" peas. The Alaska variety was most susceptible.

Septoria blight caused by Septoria pisi West.

In 1918 Septoria blight was reported from Pennsylvania, Maryland, Wisconsin (less than 1917), Ohio, Montana and Colorado. New York reported that none had been observed during the year. It was relatively unimportant wherever it occurred except in Montana where heretofore it had been of little or no consequence but during the past year had become well established and was observed doing damage in the various pea growing districts. As high as 20% loss was estimated in some of the principal pea regions. Leaves, stems and roots were affected. The lower stem and root lesions caused the most damage. According to H. M. Jennison of Montana the organism appeared to be introduced with the seed as instances were noted where peas planted on virgin soil were affected.

Mildew caused by Erysiphe polygoni D. C.

Mildew was found in Vermont, New York, New Jersey, Maryland, Georgia, Florida, Louisiana, Arkansas, Ohio, Montana, Washington and California. It was severe locally in Vermont (25% injury), New York and Georgia, and economically unimportant although quite common in Florida, California, Montana and Washington.

Root rots caused by Fusarium sp.

In 1918 Fusarium root rots were general in Massachusetts (moderately severe), New York (severe), Maryland (very severe), and Wisconsin and also reported from Connecticut (first report for state), Louisiana and Ohio. Its prevalence was about equal to that in 1917.

In fifteen counties in New York state a root rot was found which was thought to be caused by some Fusarium. About 3% injury to the entire crop was estimated in New York. No varietal resistance was noted.

R. E. Vaughan of Wisconsin suggests that rotation be practiced and that growers avoid planting in infested soil.

M. T. Cook of New Jersey believes that the loss due to this disease is of considerable importance but that they have had no way as yet of making a satisfactory estimate. The trouble was found in the spring and early summer, especially in light soils.

C. E. Temple reported the examination of three fields in Maryland which had approximately 100% of the plants diseased. These fields had been in peas for several successive years, while fields planted for the first time had little or no root rot, the average infection ran between 15 and 30%.

In Massachusetts many small growers lost their crop because of the failure of the peas to mature.

Other Diseases and Injuries 1918

Root knot caused by Heterodera radicicola (Greef.) Muller was one of the most common troubles of the crop in Florida.

Leaf spot caused by Cercospora pisa var. sativae Stev. Common in Porto Rico but unimportant. Phytophthora sp. - Frequent infection in seed pea district of Monterey Co., California.

Root rot caused by Thielvia basicola (B. & Br.) Zopf. was prevalent, but not usually serious except in gardens, in Pennsylvania. In the western part of Arkansas root rot was found most severe where sod had been broken to plant gardens which might be an indication of association of the fungus with white clover.

Frost injury - In Spokane, Co., Washington.

White pod spot (Non-parasitic) - Spokane and Whitman County, Washington.

Damping off - In New York two-thirds of the peas in one field were killed.

Stem rot - Corticium vagum var. solani Burt. A common trouble on the pea in Florida. A trace in Minnesota. Severe in Washington along Columbia River and Puget Sound region. Severe locally in Pennsylvania.

Downy mildew caused by Peronospora viciae Berk. Reported from New York, Maryland and Kansas.

PEANUT

Leaf spot caused by Cercospora personata (B. & C.) E. was found in Tennessee, South Carolina, Georgia, Porto Rico, Mississippi, Louisiana, Alabama, Oklahoma and Arkansas. It was general in occurrence in all the states where present. In Tennessee it is estimated that as high as 75% of the crop was more or less injured while the loss is estimated as 50,000 bushels. In South Carolina the crop injury was about 20%. In Georgia the injury was somewhere around 50%, resulting in an estimated loss of 5%. Entire defoliation, badly diseased stalks, and severely infected pods were found in the fields in Georgia. The forage value of the vines was reduced as well as the produc-

tion of pods. It was first noticed September 1 in Tennessee and September 4 in Georgia. All varieties appeared susceptible. In Tennessee the Virginia White seemed to be most susceptible. No treatment was recommended.

Wilt caused by Sclerotium rolfsii Sacc. was reported from Tennessee, Georgia, Alabama and Texas. Its occurrence was mostly local except in Georgia and Alabama. It was quite prevalent. The damage was generally rather slight.

Stem rot suspected as being caused by a species of Fusarium was reported in Virginia and in Tennessee heavy losses resulted from a soil disease which cultures showed to be associated with Fusarium. The symptoms, however, were like those of Rhizoctonia.

Stem rot caused by Botrytis sp. was reported from the District of Columbia. All of the plants in a garden patch were affected and produced practically no yield on account of the disease. It was first observed September 15.

Fruit rot (cause undetermined) was reported by Peltier from Alabama, causing 5% damage. It was found in a field which was not harvested promptly at maturity.

Rust caused by Uredo arachidis Lagern, was common in Porto Rico during 1918.

Yellows (cause undetermined) was reported from Alabama. It was also found in that state in 1917 when it was common locally.

Drought seriously injured peanuts in Texas and Arkansas.

SHALLOT

Pink root caused by Fusarium mallii was reported from Texas.

SOY BEAN

Root knot caused by Heterodera radicicola (Greef.) Muller was very common in South Carolina. There was a crop injury of about 25%.

Bacterial leaf spot was reported from Pennsylvania and Indiana.

Root rot caused by Sclerotium rolfsii Sacc. was very common in Alabama. The crop injury ranged from 5 to 10%. The disease was rather severe in old fields.

Wilt caused by Fusarium sp. was reported from Tennessee, South Carolina, and Alabama. In Tennessee the disease is local and increasing in prevalence, the crop injury about 5%. In South Carolina it is frequently found. In Alabama it is common and becoming more severe each year. The weather conditions during 1918 appeared to be favorable for the growth of the organism.

Drought injury was reported from Washington.

SPINACH

Blight (cause undetermined)

Spinach blight was reported only from New Jersey during 1918, although it is practically certain that it occurred in other spinach growing centers in a number of states. It has been reported to the Survey prior to 1918 from

in New Jersey. According to McClintock and Smith, the losses in eastern Virginia annually amount to at least 20% of the crop, or about $200,000 to $400,000. Abundant quantities of aphids were associated with blight in New Jersey.

A physiological disease not positively identified as blight but which caused a crinkling of the leaves was reported by G. P. Clinton as being new in Connecticut. It was found in three fields in New Haven County on August 26. More was found on Sanford White than on Sulzer's Easy Bleaching.

Downy mildew caused by Peronospora effusa Rabenh.

Downy mildew was reported from Louisiana and Texas. In Texas the disease was general but, due to the hastening of the harvest, did not cause much loss. If the spinach had been permitted to remain the full length of time in the field much damage would have resulted.

Anthracnose caused by Colletotrichum spinaciae E. & H.

This disease occurred occasionally in Connecticut during 1918 with a slight injury to the crop. In Virginia it was noticed in 1915-1917. In 1915, although not common, it resulted in about a 10% crop injury; in 1916 it was common but caused little loss; in 1917 it was common and was said to have brought about an approximate loss of 5%.

Soft rot probably caused by Bacillus carotovorus and related sp.

Table XIV. Losses from bacterial soft rot as shown by inspection of cars at destination by inspectors of the Bureau of Markets.

Origin of shipment	No. of cars with decay	Percentage of decay	Remarks as to seriousness of decay
California	1	75%	75% totally decayed stock.
Missouri	2	1 car 100%	Spinach so badly decayed as to be worthless.
		---	Bad decay in centers of baskets.
Texas	13	2 cars 100%	Contents worthless.
		1 " 100%	All spinach showing some decay.
		10 " 25-75%	Very heavy decay at top of each car, much stock worthless, salable stock only in 2 lower layers of cars.
Origin unknown	1	60-95%	Most of stock decayed and worthless.

Other diseases.

Leaf spot, caused by Macrosporium cheiranthi (Lib.) Fr., has so far been reported only from Ohio where it was found in 1915, 1917 and 1918.

Leaf spot, caused by Cercospora sp., appeared in a moderate amount in Massachusetts (first report). It was present in Texas in 1916.

A leaf spot of uncertain cause, but which showed Vermicularia as the only fungus present, was reported from New York, June 26.

Scab caused by Cladosporium macrocarpum Preuss., has not been reported to the Plant Disease Survey since 1909, at which time it was serious in the southern part of Delaware.

Rhizoctonia (Corticium vagum var. solani Burt.) was reported from Washington as occurring in Clarke County.

TEPARY BEAN

Rust caused by Uromyces appendiculatus (Pers.) Lev. was reported from Texas and California. In Texas the loss was about 10%.

Root rot caused by Ozonium omnivorum Shear was reported from Texas where it occurred especially on the Tepary bean which was the most susceptible.

Fusarium sp. was found in California. It formed lesions on the lower stems of plants.

VELVET BEAN

Bacterial leaf spot was reported from South Carolina.

Leaf spot, apparently caused by Septoria sp. was reported from Georgia where it occurred locally in Wake County, destroying 25% of the leaf surface, resulting in partial defoliation. The loss was negligible.

Leaf spot caused by Cercospora mucunae Syd. was reported from Porto Rico.

Root rot caused by Sclerotium rolfsii Sacc. was reported from Alabama.

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